

PERMEABILITY IMAGING FOR DETAILED RESERVOIR CHARACTERISATION

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Abstract High resolution permeability images generated by the nitrogen minipermeameter are a new approach to several key areas of sedimentological investigation. A study of sandstones derived from diverse depositional settings which visually appeared massive, have revealed heterogeneity on permeability images which can be identified as primary sedimentary fabric.

These images of permeability contrast frequently illustrate the subtle distribution of permeability reducing cements along preferential paths and provide improved visualisation of the progress of diagenesis through a reservoir fabric, (usually corresponding to primary depositional fabric). Minipermeameter imaging may therefore prove to be a valuable analytical tool for quantitative investigation of rock-fluid interaction. Permeability imaging effectively bridges the "scale gap" between microscopic investigation of diagenetic cement distribution and fluid flow modelling at the facies and reservoir zone scale.

This visual and quantifiable approach to assessing cement distribution could also provide a valuable additional technique in core

based investigation of rock mechanical properties in the laboratory.

The introduction of borehole imaging logs has meant that wireline vertical sampling rate (0.25cm) has outstripped typical conventional core vertical sampling intervals (25cm). Two-dimensional high resolution permeability images from core samples enable quantitative comparisons to be made with borehole wall images at similar sampling scales.